Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz	)	GN Docket No. 17-183

COMMENTS OF GENERAL COMMUNICATION, INC.

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General Communication, Inc. ("GCI") submits the following comments in response to the Federal Communications Commission's ("FCC's" or the "Commission's") Notice of Inquiry ("Notice") seeking input on potential opportunities for additional flexible access in spectrum bands between 3.7 and 24 GHz ("mid-band spectrum") in the above-referenced proceeding.[1] GCI's comments focus on the 3.7-4.2 GHz (the "3.7 GHz Band" or "C-Band"), which is extensively utilized by GCI for fixed satellite service ("FSS") operations. While GCI commends the Commission for initiating an inquiry to develop a comprehensive understanding of current mid-band spectrum uses and potential sharing opportunities, it strongly cautions the Commission against taking any action that would disrupt or otherwise interfere with the provision of longstanding important incumbent operations in these bands.

I. INTRODUCTION AND SUMMARY

GCI, through its subsidiaries, covers more of Alaska's population through its telecommunications network than any other provider in the state. Unlike the networks of large national providers, which primarily serve only the most populated urban areas of Alaska, GCI

[1] *Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz*, GN Docket No. 17-183, Notice of Inquiry, FCC 17-104 (rel. Aug. 3, 2017) ("Notice").

provides a wide breadth of coverage across the entire state, particularly in under-or otherwise entirely un-served remote rural areas. GCI's longstanding familiarity with the unique demands of the Alaskan marketplace and environment, its deep resources in Alaska, and its understanding of the needs of Alaskans, have all contributed to the development and deployment of the largest broadband network in Alaska. As GCI has found, providing broadband service to Alaska is particularly challenging. Such challenges include "its remoteness, lack of roads, challenges and costs associated with transporting fuel, lack of scalability per community, satellite and backhaul availability, extreme weather conditions, challenging topography, and short construction season."[2] Therefore, GCI must utilize a variety of technologies in order to provide dependable services, and often must do so in innovative ways. This includes using FSS in conjunction with its terrestrial mobile and fixed wireless networks, largely in areas where fiber deployment is not possible.

Simply put, GCI provides critical services over the C-Band spectrum. GCI relies on mid-band spectrum in order to provide FSS operations, and has a very long history of utilizing the C-Band to provide broadband and video communications services throughout Alaska. Specifically, GCI uses the 3.7 GHz Band for downlink FSS operations and this band is particularly important to GCI due to the critical and important services provided over this spectrum. Many of these critical services, if interrupted, could result in life-threatening situations. For instance, many of GCI's C-Band sites serve customers residing in the most rural and remote areas of the country who rely exclusively on satellite technology for the provision of basic telephone service, medical

[2] *Connect America Fund; Universal Service Reform – Mobility Fund; Connect America Fund - Alaska Plan*, Report and Order and Further Notice of Proposed Rulemaking, 31 FCC Rcd 10139, 10162,¶ 72 (2016) ("*Alaska Plan R&O*") (citing *Connect America Fund et al.*, Report and Order and Further Notice of Proposed Rulemaking, 26 FCC Rcd 17663, 17829,¶ 507 (2011) ("*USF/ICC Transformation Order"*), *aff'd sub nom. FCC 11-161*, 753 F.3d 1015 (10th Cir. 2014)).

service, and distance-learning. Federal agencies, such as the Federal Aviation Administration ("FAA"), for example, also depend on GCI's operations in this spectrum to assist pilots in determining local weather conditions throughout the state. In many cases, GCI's satellite services are the only communications option that Alaskans can rely upon to contact emergency officials in critical situations.

While the Notice seeks to explore "potential opportunities for additional flexible access – particularly for wireless broadband services – in spectrum bands between 3.7 and 24 GHz,"[3] GCI is very concerned about introducing poorly coordinated fixed and mobile wireless services into the 3.7 GHz Band due to the unique technical and operating needs apparent within this band. The Commission aptly initiated this proceeding with a Notice of Inquiry in an effort to invite viable sharing and protection proposals, rather than commencing with a Notice of Proposed Rulemaking. GCI cautions the Commission against taking action before the record has had a chance to fully develop.

GCI appreciates the need to make additional spectrum available for mobile use; however, the Commission must be cognizant of incumbent uses as well. The FCC's role in developing a record to do so is critical and GCI urges the Commission to take its time to evaluate sound proposals. The technical components of earth stations that receive C-Band signals make them uniquely sensitive to interference and it has been previously demonstrated that sharing this spectrum with terrestrial services is difficult. In addition, GCI uses the entire 500 MHz C-Band spectrum allocation on many of its sites and, in the few locations where it uses just less than the full 500 MHz, relies on the flexibility afforded by the FCC's rules, such as the full-band, full-arc

[3] Notice ¶ 1.

coordination policy, to efficiently shift frequencies and satellites in the event of a transponder or satellite failure or market competition (resulting in capacity cost reductions).

The Notice seeks comment on changes to these policies, as well as introducing other policies, such as a Spectrum Access System ("SAS") or other frequency coordination method. At this time, GCI has not found that any of these proposals, nor any other potential approaches, will adequately protect its critical FSS operations from interference if terrestrial wireless services are introduced. GCI therefore remains opposed to introducing fixed and/or mobile wireless operations into the 3.7 GHz Band. Proposed 3.7 GHz sharing proposals thus far have not adequately addressed the need for a rigorously defined and executed interference mitigation plan that ensures continuity of service for earth station operators, particularly in light of the increased sensitivity of earth station receivers to the presence of coherent and incoherent noise conditions.

II. GCI EXTENSIVELY USES THE C-BAND FOR THE PROVISION OF CRITICAL BROADBAND SERVICES TO CONSUMERS, BUSINESSES, AND GOVERNMENT ENTITIES

The Notice seeks updated information on the current uses of the 3.7 GHz Band, recognizing that several services use this band.[4] GCI highly values the C-Band for the same reason that the Commission has traditionally sought to protect it: "its propagation characteristics allow for greater service reliability compared to other bands, especially in adverse weather conditions."[5] Indeed, it was for these reasons that GCI chose to invest significant resources (over $100 million) in developing and deploying its FSS services over this band– with the investment of these resources premised on continued access to this spectrum. As a result of that

[4] *Id.* ¶¶ 13-15.

[5] *In the Matter of Amendment of the Commission's Rules with Regard to Commercial Operations in the 3550-3650 MHz Band*, GN Docket No. 12-354, Report and Order and Second Further Notice of Proposed Rulemaking, FCC 15-47, ¶292 (rel. Apr. 21, 2015) ("*3.5 GHz Report and Order*").

investment, GCI also has over 130 C-Band sites in Alaska (many of which are equipped with multiple antennas), ranging from hub sites in large cities like Anchorage and Fairbanks to small, remote islands such as Atka and Nikolski.[6] GCI uses the 3.7 GHz Band for middle-mile backhaul services[7] as well as for traditional video content distribution.

GCI uses the entire 500 MHz C-Band receive spectrum allocation[8] on many of its sites and currently operates on three full time satellites, with its stations configured to restore services across two additional satellites at different orbital locations than their primary service locations.[9] 40 of GCI's 130 earth stations are receive-only ("Rx-only"), with the remainder being used for transmit and receive ("Tx/Rx"). In GCI's experience, the majority of western arc C-Band FSS satellites typically have 24 transponders, each with a bandwidth of 36 megahertz received by one or more earth stations.[10] However, other transponder designs have bandwidth up to 108 MHz and GCI currently uses certain designs up to 72 MHz.

[6] The majority of earth stations utilized by GCI employ 3.6m aperture antennas; GCI also uses some larger aperture antennas (6.2m, 7.1m, 9m, 13m). GCI currently uses Satmex 7 at 115 WL and Galaxy 18 at 123 WL for full time services. All of GCI's C-Band stations providing network services are licensed with the FCC pursuant to 47 C.F.R. Part 25, with the major hub stations in Eagle River and Fairbanks. GCI's network is also configured to provide restoration capabilities on Galaxy 12 at 129 WL and Galaxy 13 at 127 WL. In the past five years GCI has operated network services, at a variety of earth stations on satellites also located at 139 WL, 137 WL, 135 WL and is currently reviewing other western arc satellites for possible use in its network.

[7] For backhaul purposes, when data is requested by a source ("SRC") host, it is delivered to the region's C-Band earth station and is uplinked via the 5.925-6.425 GHz Band ("6 GHz") Band to the satellite and then downlinked, translating the frequency from 6 GHz to the 3.7 GHz Band for reception at the receiving earth station. Transponders assist by unlinking (at 6 GHz) and downlinking (at 3.7 GHz) the data response.

[8] GCI is not the only licensee that uses the whole band; teleports often use the entire band across multiple orbital slots with many antennas in service.

[9] *See* Notice ¶ 14.

[10] *See id.*

The 3.7 GHz Band is particularly important to GCI and other FSS earth station operators in Alaska that face significant and unique challenges in providing telecommunications services to the state, including limited satellite coverage, increasing capacity, and interference issues. This spectrum helps alleviate some of these concerns, as it enables GCI to provide critical and important services via 2G and LTE-over-Satellite data services, among other technologies that GCI uses to provide services to its customers via the C-Band. Many of these critical services, if interrupted, could result in life-threatening situations. In many instances, GCI's C-Band satellite operations are the only way that Americans in Alaska are able to make and receive life-saving communications. Below are a number of examples of broadband and other telecommunications services provided by GCI across the 3.7 GHz spectrum:

Critical Long-Distance Services. GCI offers Measured Toll Service ("MTS") for consumers and businesses using its licensed C-Band spectrum. For many remote villages in the northern, western, and interior regions of Alaska, this is oftentimes the only communications link to the "outside world," allowing these residents to contact state troopers and other emergency officials at all times, but especially in critical situations. Many of these communities have no terrestrial (or other) transmission alternative. GCI also provides long-distance private line (special access) services to businesses, native corporations, and local, state and federal governments. These operations also service FAA circuits and other government agency circuits, helping to ensure that the most critical and secured communications travel from and reach their intended destination. Any interference to such circuits could result in the potential for injury or loss of life.

Alaska Plan. The Commission has previously expressed concern that "[o]ver 50 communities in Alaska have no access to mobile voice service today, and many remote Alaskan

communities have access to only 2G services."[11] In recognizing that the unique climate and geographic conditions of Alaska have the effect of hindering deployment of fixed and mobile voice and broadband service to the state, the Commission adopted a plan in 2016 to help extend and upgrade the state's broadband service to support a large number of underserved and unserved communities (the "Alaska Plan").[12] Objectives of the Alaska Plan include, but are not limited to, introducing broadband service to over 36,000 new residents at speeds of 10/1 Mbps and upgrading almost 70,000 residents to 25/3 Mbps,[13] which requires GCI to deploy 4G LTE or better service to more than 100,000 remote Alaska residents.[14] The C-Band plays a critical role in GCI's contribution to the Alaska Plan. To meet its obligations under the Alaska Plan, GCI uses this spectrum to deliver middle-mile capacity with the last-mile LTE service – a critical initiative to provide needed services to under and under-served areas.[15] GCI has already allocated specific spectrum in Dutch Harbor, Barrow and other served and to-be-served sites. Currently, GCI has approximately 1.25 transponders (36 MHz each) dedicated to this cause with plans to increase spectrum-use in the near-term. If GCI's access to the C-Band were to be modified or interrupted in any way, it could jeopardize GCI's ability to comply with the obligations it assumed under the Alaska Plan.

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[11] *USF/ICC Transformation Order* ¶ 529.

[12] Indeed, the Commission has recognized that "competitive ETCs in Alaska's most remote regions face conditions unique to the state, and much of Alaska's remote areas remain unserved or underserved by mobile carriers." *Alaska Plan R&O* ¶ 66.

[13] *Id.* at ¶ 8.

[14] *Id.* at ¶ 73.

[15] *See Wireless Telecommunications Bureau Approves Performance Plans of The Eight Wireless Providers That Elected to Participate in the Alaska Plan*, Public Notice, WC Docket No. 16-271, Appendix A, page 6 (2016).

Telehealth. Through its "ConnectMD" network, GCI supports the delivery of telemedicine services such as teleradiology, remote patient monitoring, medical network solutions, and live video-conferencing to customers in Alaska.[16] These C-Band sites provide backhaul to government health providers such as North Slope Borough Department of Health and Social Services,[17] as well as Tribally-operated, non-profit health and social services organizations like the Arctic Slope Native Association.[18]

As discussed in prior comments,[19] GCI has witnessed firsthand the transformational benefits of telemedicine for health care delivery in Alaska. These services improve healthcare in areas that traditionally have few physicians and even fewer medical specialists in a variety of medical fields, including audiology, cardiology, dental, family medicine, neurosurgery, ophthalmology, pediatrics, psychiatry, and women's health. In most instances, the ConnectMD network is the only way that rural Alaskans may gain access to such specialists. For example, without telepsychiatry services, residents seeking psychiatric care in many remote villages would either have to wait for a sporadic visit from a traveling psychiatrist, or would have to travel vast distances – usually at a prohibitively high cost – to seek the medical help that they needed.[20] Neither of these options would likely be possible during the harsh long Alaskan winter.

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[16] *See* GCI ConnectMD, http://www.connectmd.com/ (last visited Oct 2, 2017).

[17] The North Slope Borough, http://www.north-slope.org/departments/health-social-services (last visited Oct 2, 2017).

[18] Samuel Simmonds Memorial Hospital, http://www.arcticslope.org/ (last visited Oct. 2, 2017).

[19] *See, e.g.*, Comments of General Communication, Inc., RM-11791 (filed Aug. 7, 2017); Reply Comments of General Communication, Inc., GN Docket No. 12-354 (filed Aug. 14, 2015); Comments of General Communication, Inc., WC Docket No. 02-60 (filed Sept. 8, 2010).

[20] For example, "the transportation costs, and then all of the other unintended costs that go along with that, traveling through Alaska [are a problem] . . you're out of your village. You have costs if someone travels with you. You have food and lodging." Joaqlin Estus, *Study Shows Telepsychiatry Effective for Alaska Elders*, NEW AMERICA MEDIA (Feb 13, 2014), http://newamericamedia.org/2014/02/study-shows-telepsychiatry-effective-for-alaska-elders.php.

However, telepsychiatry has "extended the clinical infrastructure of the [Alaska Psychiatric Institute] hospital to areas typically not served by mental health professionals,"[21] and when a resident in a remote area such as Kiana, located in the northwest Arctic Borough of Alaska, needs immediate or on-going care for depression, bipolar disorders, or even schizophrenia, GCI's ConnectMD network enables the patient to visit with a specialist remotely, via a remote village clinic, on their own schedule. ConnectMD has allowed these communities to offer readily-available, cost-effective psychiatric services to its residents, eliminating any need for residents to take long and expensive trips to faraway cities just to seek medical attention. Importantly, ConnectMD also allows participating communities to accommodate patients with sudden symptoms, often developing treatment plans without the need for costly hospitalization.

Long-Distance Learning. GCI's SchoolAccess network provides broadband access, video conferencing and state-of-the-art digital tools to schools and libraries in rural and underserved regions of the United States.[22] This program focuses on K-12 school and library environments and currently serves more than 100,000 patrons.[23] The SchoolAccess services have become an essential part of educating students in rural areas, with its video service logging more than 2.25 million minutes each year in Alaska, New Mexico, and Montana.[24]

The Ouzinkie and Port Lions schools, which are located on separate islands off the coast of Alaska (and are part of a single school district - the Kodiak Island Borough School District

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[21] ALASKA DEP'T OF HEALTH AND SOC. SERVS., STATUS REPORT ON TELEHEALTH AND HEALTH INFORMATION TECHNOLOGY PROGRAMS AND INITIATIVES IN ALASKA, 11 (Feb. 2011) *available at* http://dhss.alaska.gov/dph/HealthPlanning/Documents/telehealth/2010_Telehealth_and_HIT_Initiatives_in_Alaska.pdf.

[22] GCI SchoolAccess, http://www.schoolaccess.net/public-general/services (last visited Oct. 2, 2017).

[23] GCI SchoolAccess, About, http://www.schoolaccess.net/public-general/about (last visited Oct. 2, 2017).

[24] *Id*.

("KIBSD")), heavily rely on GCI's SchoolAccess video services to bring their rural students under one virtual "roof."[25] For instance, these services have allowed students at Ouzinkie and Port Lions schools, along with other students in the school district, to participate (virtually) in district-wide online music performances, and have also spurred an island-wide leadership group that meets via video conference so all students can participate. All children in the district also are now afforded the opportunity to participate in online, state-wide programs and competitions, including Battle of Books, a statewide reading motivational and comprehension program; the District Spelling Bee; and Alaska Robotics, the state-level science and engineering fair.[26] The opportunities do not end there: distance-learning has not only increased academic, athletic and social collaboration between the district's geographically isolated students, but has also led to improved test scores among its students, providing a greater opportunity for these students to attend college.[27]

The services provided by GCI's SchoolAccess have become an essential part of educating students in rural Alaska by allowing children in remote areas to gain an education that would otherwise not be available without leaving home, and such services rely on the C-Band for backhaul.

FAA Assistance. Due to the enormous size of the state and lack of road infrastructure, the use of small aircraft for day-to-day travel is common in rural Alaska. Unfortunately, due to weather, mountainous terrain, and the lack of adequate mapping, travel by small aircraft comes with inherent risk. Pilots routinely find themselves in rough weather and must decide whether to

[25] GCI SchoolAccess, Success Story: KIBSD and AKTEACH Making Globalized Education Happen through Digital Connection, http://www.schoolaccess.net/public-general/success-stories/kodiak-island (last visited Oct. 2, 2017).

[26] *Id.*

[27] *Id.*

turn around and try again later – at significant expense and inconvenience to their passengers – or face the increased risk of flying in potentially unsafe conditions. For over a decade, GCI has been working with the FAA on a program that provides real-time weather-camera information to pilots using the GCI satellite network for middle-mile backhaul. Based on data compiled by the FAA, this program has reduced weather-related aviation incidents in Alaska by *85 percent*, and has reduced how often pilots must turn a plane around due to weather by *66 percent*.[28]

III. THE 3.7 GHZ BAND HAS UNIQUE TECHNICAL AND OPERATING REQUIREMENTS

The Notice seeks comment on the ability of additional fixed or mobile services to coexist in the 3.7 GHz Band with FSS services, and asks for input on changes to current operating or technical rules that may better allow for sharing. GCI is concerned that introducing additional fixed or mobile services has the potential to disrupt GCI's access to the C-Band, which could result in catastrophic interruptions to Alaska's critical communications services if not properly coordinated and managed.

As an initial matter, band sharing in the 3.7-4.2 GHz band is problematic due in large part to the actual technology utilized by FSS-receive systems. The Notice recognizes that "FSS earth station deployment in the 3.7-4.2 GHz Band is much more significant" than deployment in other bands where mobile, fixed and FSS services coexist.[29] The sheer quantity of FSS deployment coupled with the unique operating needs of these services result in specific challenges to mobile and fixed uses that may not be present in other bands.[30] For instance, the received signal level ("RSL") at the satellite antenna is extremely small, such that very sensitive low-noise amplifiers

[28] GCI, News Release, *Weather Camera Program Protects Pilots, Saves Lives in Alaska* (Apr. 19, 2017) https://www.gci.com/about/newsreleases/weather-camera-program.

[29] Notice ¶ 20.

[30] *See id.*

("LNAs") are required to recover the signal and discriminate it from the thermal noise floor. Accordingly, the presence of even small amounts of external, intentional radiator energy can easily overwhelm the input signal limits of an LNA and saturate it.[31] In short – even the smallest levels of interference could be harmful to the provision of services over the C-Band. Indeed, GCI requires clear, unobstructed access to and from the target satellite in order to achieve reliable operation of circuits delivered via satellite. Alternatively, if saturation of the input does not occur, the presence of interference increases the noise density and causes a degradation of the signal quality, rendering the signal unrecoverable.

Once interference occurs, the mitigation of that interference can become very difficult to realize because multiple terrestrial transmitters could operate in the same region, with spectrum re-use. Service-affecting interference events occur in existing satellite networks as new antennas come into networks or fall out of performance specifications. Under those conditions, identifying the source of the interference, particularly if the operation is intermittent or time-of-day specific, could take days or weeks, and requires expensive, complex triangulation systems. Such an occurrence would effectively cripple the critical services already being provided in the band, resulting in a period of outage for GCI's customers who rely on the various services described herein as their only means of connectivity to emergency services.

In order to avoid such disruptions to services, GCI has developed and deployed its operations in reliance on the FCC's long-standing service rules and coordination policies. Revising the current coordination policies of the 3.7 GHz Band will result in catastrophic

[31] Received signals from geostationary satellites are dramatically lower than those observed in terrestrial microwave solutions. This requires the use of ultra-sensitive low noise amplifier components in order to overcome thermal noise. The presence of intentional, in-band interferers can easily swamp the input power threshold of an LNA.

disruptions to FSS operations. In addition, GCI responds below to some of the proposals concerning interference coordination highlighted by the Notice:

Full-Arc, Full-Band Coordination Policy: GCI's ability to effectively utilize the C-Band spectrum is due in large part to the well-established flexible operating rules, such as the "full band, full arc" policy associated with the band. GCI relies on this flexibility afforded by the FCC's rules to efficiently shift frequencies and satellites in the event of a transponder or satellite failure or market competition (resulting in capacity cost reductions). In addition to relying on primary, full-time satellites, GCI also requires the ability to operate on other western arc satellites with very little notice (*i.e.*, less than four hours) in order to provide restoration of terrestrial networks that service rural Alaska. GCI has also contracted with satellite providers to obtain "in-orbit protection," which allows GCI to access additional capacity at other orbital location (with priority assignment) in the event that the primary spacecraft experiences a catastrophic failure.

The Notice recognizes several proposals that have been submitted to the Commission seeking to modify or eliminate the "full band, full arc" policy that FSS operators rely upon to provide uninterrupted service to their customers.[32] Most recently, the Broadband Access Coalition ("BAC") petitioned the FCC to initiate a rulemaking to amend and modernize Parts 25 and 101 of the Commission's Rules to authorize and facilitate a new, licensed fixed wireless point-to-multipoint ("P2MP") high-speed broadband service on a shared basis in the 3.7 GHz Band (the "BAC Petition").[33] Specifically, the BAC Petition suggested modifications to the

[32] Notice ¶ 17. *See also* Petition for Rulemaking, Broadband Access Coalition, RM-11791 (filed June 21, 2017) ("BAC Petition"); Petition for Rulemaking, Fixed Wireless Communications Coalition, Inc., RM-11778 (filed Oct. 11, 2016) ("FWCC Petition").

[33] *See* BAC Petition.

Commission's rules, including, but not limited to, eliminating the Part 25 well-established "full band, full arc" coordination policy and replacing it with an untested and ill-advised "real-time, real-world" FSS protection scheme, as well as introducing a new subpart K to the Part 101 rules that will provide performance and registration requirements to accommodate P2MPs in the 3.7 GHz Band.[34] As GCI advocated in its comments opposing the BAC Petition, these proposals, if adopted, would adversely impact existing FSS operations and the critical services provided pursuant to such operations.[35]

Similarly, the Fixed Wireless Communications Coalition, Inc. ("FWCC") also recently proposed radical modifications to the coordination procedures that would require FSS earth stations to coordinate specific combinations of frequency, azimuth, and elevation angle for immediate use, rather than allow such stations to coordinate across an entire frequency band, and over the entire geostationary arc under "full band, full arc" coordination as is currently permitted by the FCC's rules.[36] The proposals brought forth in the 2016 FWCC petition were duplicative of a request raised by FWCC in 1999, which was reviewed and dismissed by the Commission without taking any action.[37] GCI participated in both the 2016 and 1999 proceedings, and has

[34] *See generally id.*

[35] Comments of General Communication, Inc., RM-11791 (filed Aug. 7, 2017). GCI hereby incorporates these comments into this submission.

[36] *See* FWCC Petition.

[37] The Commission's rejection was largely based on its finding that "FWCC failed to demonstrate that FS networks face any disadvantage due to full-band, full-arc earth station licensing." Petition to Dismiss or Deny of the Satellite Industry Association in RM-11778, at 3 (filed Jan. 9, 2017) ("SIA Petition"); *see also FWCC Request for Declaratory Ruling on Partial-Band Licensing of Earth Stations in the Fixed-Satellite Service,* Notice of Proposed Rulemaking, 15 FCC Rcd 23127 (2000); *FWCC Request for Declaratory Ruling on Partial-Band Licensing of Earth Stations in the Fixed-Satellite Service,* Second Report and Order, 17 FCC Rcd 2002 (2002) (terminating the proceeding without taking any action).

been advocating against a change to the full-band, full arc policy for over 15 years.[38] Eliminating the full-band, full-arc coordination policy ignores the very-real fact that changes in frequency are an integral part of the day-to-day operations of FSS operators, including GCI, and no party has developed a compelling case to the contrary.

Frequency Coordination: Band sharing in the 3.7 GHz Band will also likely not be successful if new frequency coordination policies are adopted.[39] Such a policy would be difficult, if not impossible, to implement as proposed from a practical perspective because the C-Band is home to a large number of unlicensed Rx-only antennas used by the broadcast industry (pursuant to the FCC's rules). From a coordination perspective, fixed or mobile services cannot be aware of these antennas because there is no available record of their presence, and frequency coordination only has the potential to work if all antennas subject to the interference potential are registered or licensed with the FCC.[40] Regardless, if Rx-only antennas experience interference, it sets off a chain reaction that exposes the rest of the network (i.e., registered earth stations and antennas) to interference, thus failing to accomplish the very attribute that frequency coordination seeks to achieve.

Database-Supported Authorization Framework: Similarly, relying on a database-supported authorization framework such as the SAS model adopted for CBRS in the 3.5 GHz

[38] *See, e.g.*, Reply Comments of General Communication, Inc., RM 11778 (filed Jan. 24, 2017); Letter from Kathleen S. O'Neill, Counsel to GCI, Drinker Biddle & Reath LLP, to Magalie Roman Salas, Secretary, FCC, IB Docket No. 00-203 (Mar. 1, 2001); Reply Comments of General Communication, Inc., IB Docket No. 00-203 (filed Feb. 10, 2001).

[39] Notice ¶ 18 (encouraging "specific changes to coordination requirements and technical and operating rules.").

[40] If a frequency coordination policy was adopted by the FCC, it would effectively force all antennas operating in the 3.7 GHz – 4.2 GHz band to be registered. This would greatly increase the administrative burden on operators and further constrain network management practices – while still not allowing for necessary interference protection.

Band would also not be appropriate for the 3.7 GHz Band at this time.[41] Not only would the SAS not be aware of the Rx-only antennas as noted above, but it would be premature to adopt an untested authorization framework in a band with significant incumbent use. Before adopting a SAS model for the mid-range bands, this framework must first be fully implemented in the 3.5 GHz band and evaluated by the Commission and industry stakeholders alike. Indeed, the SAS is still being developed and finalized, and neither the Commission nor industry participants know how or whether the SAS will work.[42] In addition, due to the arguments noted above, GCI does not believe that a SAS system could operate in a fashion necessary to protect interference to its services. GCI has previously expressed concerns with the SAS's ability to mitigate interference from 3.5 GHz CBRS users to its C-Band operations (to the extent it is contemplated under the rules), and those concerns extend to this proceeding as well.[43]

Accordingly, such proposals should not be entertained by the FCC as a means to encourage sharing in the 3.7 GHz Band as they cannot prevent – and likely would introduce – catastrophic interference into the C-Band operations. The Commission must not proceed with permitting wireless operations to share the C-Band unless there are engineering studies and

[41] *See* Notice ¶ 22.

[42] For instance, Paige Atkins, Associate Administrator in the Office of Spectrum Management at NTIA, explained that "'[i]t's really about getting to a point where we've established some level of confidence across the stakeholders. . . w[]e're already taking about employing SAS. . . in other bands when we haven't even fully proven it out.'" Howard Buskirk, *Approach to Cybersecurity Seen as Providing Model for Interference Protection*, COMMC'NS. DAILY., Sept. 19, 2016, at 2.

[43] *See, e.g.*, General Communication, Inc. Ex Parte Notice, GN Docket No. 15-319 (filed June 24, 2016); General Communication, Inc. Ex Parte Notice, GN Docket No. 12-354 (filed Jan. 8, 2016); General Communication, Inc. Ex Parte Notice, GN Docket No. 12-354 (filed Sept. 21, 2015) Reply Comments of General Communication, Inc., GN Docket No. 12-354 (filed Aug. 14, 2015).

testing reports on the record that demonstrate that C-Band earth stations will be adequately protected against interference from these services.

IV. CONCLUSION

FSS operators such as GCI have relied upon unencumbered access to the entire 500 MHz offered in the 3.7-4.2 GHz band for many years to provide critical services to customers in remote or rural areas. Modifying the current 3.7 GHz landscape by introducing fixed and mobile wireless services would adversely impact GCI's operations, and the customers that rely on them the most. Accordingly, GCI urges the Commission to refrain from making changes to the current operating and technical service rules for 3.7 GHz licensees.

Respectfully submitted,

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